

WHAT IS CLAIMED IS:

- 1                   1.       An apparatus for removing a forming element from a concrete  
2 pipe, the apparatus comprising:  
3                   a support member; and  
4                   a removal device including first and second elements, the first  
5 element being attachable to the forming element and having a stop, the second  
6 element being supported by the support member such that the second element is  
7 swingable with respect to the support member, the second element further being  
8 engageable with the stop so as to apply a force to the first element for removing the  
9 forming element from the concrete pipe.
- 1                   2.       The apparatus of claim 1 wherein the first element is a guide  
2 element that is configured to guide movement of the second element.
- 1                   3.       The apparatus of claim 1 wherein the first element includes  
2 a channel that receives at least a portion of the second element.
- 1                   4.       The apparatus of claim 1 wherein the second element has an  
2 I-shaped cross-section.
- 1                   5.       The apparatus of claim 1 wherein the second element includes  
2 a cylindrical body that receives the first element.
- 1                   6.       The apparatus of claim 1 wherein the first element has a first  
2 generally rectangular cross-section, the second element has a second generally  
3 rectangular cross-section, and the first element extends through the second element.
- 1                   7.       The apparatus of claim 1 further comprising two cables  
2 connected between the support member and the second element for allowing the  
3 second element to swing with respect to the support member.

1                   8.     The apparatus of claim 1 further comprising two chains  
2     connected between the support member and the second element for allowing the  
3     second element to swing with respect to the support member.

1                   9.     The apparatus of claim 1 wherein the first element is  
2     supported by the support member.

1                   10.    The apparatus of claim 9 wherein the support member  
2     includes a support frame and a trolley that is laterally movable with respect to the  
3     support frame, and wherein the first and second elements are supported by the  
4     trolley such that the first and second elements are laterally movable with respect to  
5     the support frame.

1                   11.    The apparatus of claim 9 wherein the trolley includes a base  
2     and a support beam removably attached to the base such that the support beam may  
3     be adjusted laterally with respect to the base, and wherein the first and second  
4     elements are supported by the support beam.

1                   12.    The apparatus of claim 1 further comprising a hoist supported  
2     by the support member and attachable to the forming element, the hoist being  
3     configured to control movement of the forming element after the forming element  
4     has been removed from the concrete pipe.

1                   13.    The apparatus of claim 12 wherein the support member  
2     includes a support frame and a support arm pivotally connected to the support  
3     frame, wherein the hoist is movably attached to the support arm.

1                   14.    An apparatus for removing a forming element from a concrete  
2     pipe, the apparatus comprising:  
3                   a support member;  
4                   a guide element suspended from the support member and attachable  
5     to the forming element, the guide element having a guide channel and a stop  
6     disposed at a distal end of the guide channel; and

7                   a pendulum element having an I-shaped cross-section and being  
8                   suspended from the support member such that the pendulum element is swingable  
9                   with respect to the support member, the pendulum element being movable along at  
10                  least a portion of the guide channel and being engageable with the stop so as to  
11                  apply a force on the guide element, thereby causing the guide element to apply a  
12                  removing force on the forming element.

1                   15.     A method of removing a forming element from a concrete  
2                   pipe, the method comprising:  
3                             attaching a guide element to the forming element, the guide element  
4                   having a stop; and  
5                             swinging a pendulum element such that the pendulum element  
6                   engages the stop and applies a force on the guide element, thereby causing the guide  
7                   element to apply a removing force on the forming element.

1                   16.     The method of claim 15 wherein the guide element has a guide  
2                   channel that receives at least a portion of the pendulum element as the pendulum  
3                   element swings.

1                   17.     The method of claim 15 wherein the pendulum element has  
2                   an I-shaped cross-section.

1                   18.     The method of claim 15 wherein the pendulum element  
2                   includes a cylindrical body, and the guide element extends through the cylindrical  
3                   body.

1                   19.     The method of claim 15 wherein the guide element and the  
2                   pendulum element each have a generally rectangular cross-section, and the guide  
3                   element extends through the pendulum element.

1                   20.     The method of claim 15 wherein the pendulum element is  
2                   supported by a support member such that the pendulum element is swingable with  
3                   respect to the support member.

1                   21.    The method of claim 20 wherein the guide element is also  
2 supported by the support member.

1                   22.    The method of claim 15 further comprising adjusting swing  
2 weight of the pendulum element.

1                   23.    An apparatus for separating a first object from a second  
2 object, the apparatus comprising:  
3                   a support member; and  
4                   a removal device including first and second elements, the first  
5 element being attachable to the first object and having a stop, the second element  
6 being supported by the support member such that the second element is swingable  
7 with respect to the support member, the second element further being engageable  
8 with the stop so as to apply a force to the first element for separating the first object  
9 from the second object.

1                   24.    The apparatus of claim 23 wherein the first element is a guide  
2 element that is configured to guide movement of the second element.

1                   25.    The apparatus of claim 23 wherein the first element includes  
2 a channel that receives at least a portion of the second element.

1                   26.    The apparatus of claim 23 wherein the second element has an  
2 I-shaped cross-section.

1                   27.    The apparatus of claim 23 wherein the second element  
2 includes a cylindrical body that receives the first element.

1                   28.    The apparatus of claim 23 wherein the first element has a first  
2 generally rectangular cross-section, the second element has a second generally  
3 rectangular cross-section, and the first element extends through the second element.

1                   29.    The apparatus of claim 23 further comprising two cables  
2   connected between the support member and the second element for allowing the  
3   second element to swing with respect to the support member.

1                   30.    The apparatus of claim 23 further comprising two chains  
2   connected between the support member and the second element for allowing the  
3   second element to swing with respect to the support member.

1                   31.    The apparatus of claim 23 wherein the first element is  
2   supported by the support member.

1                   32.    The apparatus of claim 31 wherein the support member  
2   includes a support frame and a trolley that is laterally movable with respect to the  
3   support frame, and wherein the first and second elements are supported by the  
4   trolley such that the first and second elements are laterally movable with respect to  
5   the support frame.

1                   33.    The apparatus of claim 31 wherein the trolley includes a base  
2   and a support beam removably attached to the base such that the support beam is  
3   laterally adjustable with respect to the base, and wherein the first and second  
4   elements are supported by the support beam.

1                   34.    The apparatus of claim 23 further comprising a hoist  
2   supported by the support member and attachable to the first object, the hoist being  
3   configured to control movement of the first object after the first object has been  
4   separated from the second object.

1                   35.    The apparatus of claim 34 wherein the support member  
2   includes a support frame and a support arm pivotally connected to the support  
3   frame, wherein the hoist is movably attached to the support arm.